

Socioeconomics Characteristics Of Common Bean Variety Adoption And Seed Quality Survey In Southern Region, Ethiopia

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Abstract: This survey provides primary information on the current status of bean seed systems with the objective of assessing haricot bean varieties adopted in the study area and the informal seed systems maintaining seed quality for participating and non-participating farmers and their adoption rate of improved bean varieties is more than 90% with the approach of using partner NGOs and this has significantly increase their production and productivity to improve their livelihood.

Index terms: Adoption rate, impact, price sensitivity, seed system, and seed quality.

1. INTRODUCTION

More than 85% of the Ethiopian population, which resides in the rural area, is engaged in agricultural production as a major means of livelihood (World Bank, 2006). The agricultural production system is mainly rain fed and traditional, which is characterized by low input of improved seeds, fertilizer, pesticides and other technologies [7]. Moreover, the ever increasing population pressure led to decline in land holding per household that eventually resulted in low level of production to meet even the consumption requirement of the households [1]. Although haricot bean is largely grown in Ethiopia, the national average yield of haricot beans is low ranging from 0.5 to 0.8 tone ha⁻¹, which is far below the corresponding yield recorded at research sites (2.5 – 3 tones ha⁻¹) using improved varieties [8]. The low national mean yield observed for haricot bean could be attributed to various constraints related to low adoption of improved agricultural technologies, drought, and lack of improved varieties, poor cultural practices, disease, and environmental degradation. In essence of things, the generation and transfer of technologies is not an end in itself. Therefore, increasing productivity and production of common bean will be realized if and only if the farmers adopt the technologies that are developed by research. However, the genetic potential yields of the varieties have to be maintained to boost production and productivity to improve their income and livelihood. This paper deals with the type of varieties adopted by farmers who were participants as beneficiaries of the project in getting different haricot bean varieties through partner organizations in the respective study areas and non-participants. With regard to economic importance

of common bean, it is used as source of foreign currency, food crop, means of employment, source of cash, and plays great role in the farming system [2]. According to EPPA [3] in the year 2000, 2001 and 2002 Ethiopia exported 23994.4, 32932.7 and 42127.0 tones and earning 8.2, 9.98 and 13.2 million USD respectively. The main destination markets were Pakistan, Germany, Yemen, UK, South Africa, India and Mexico having 12.5, 7.8, 6.9, 5.79, 4, 4, 4 % share respectively (EPPA 2004). The country's exports of haricot beans have increased over the last few years, from 58,126 MTs in 2005 to 78,271 MTs in 2007 and Ethiopia gets 63 million dollar from haricot bean market in 2005.

2. OBJECTIVE

- To assess common bean varieties adopted in the study area;
- To know how the informal seed systems maintain seed quality.

3. RESEARCH METHODOLOGY

3.1 The Study Area

The study area includes major bean growing areas of the Southern Region (Sidama (Dale), Wolayita (Sodo Zuria and Damote Gale) Gamogofa Zones (Gofa) and Amaro special woreda).

3.2 Sampling Procedure

Purposive sampling was used to select the zone, districts and peasant associations where the five partner organizations (NGOs) mandate area, IPMS/ILRI (Dale), Agric-service (Amaro), Inter-red France (Bodite), ERSHA(Gofa), WONTA (Sodo). Sample farmers were selected from the participants (54) and from non-participants of the projects (58) and the total sample size of 112 households with gender consideration. The quantitative survey was conducted during 2009/10 cropping season by the respective partner organization.

3.3. Analytical Model

The analysis was descriptive statistics such as chi-square, t-test, frequency, mean and etc using statistical soft ware SPSS.

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4. RESULTS AND DISCUSSIONS

4.1 Farmers Seed Quality Assessment

4.1.1 Demographic and Socioeconomics Characteristics

The quantitative data was disaggregated as Farmers who have bean participants and those non- participants. The gender of farmers who were participants was 89% male and 11% female. Hence for the non- participants was 95% male and 5% female. The source of income is exclusively from agriculture according to 48% of participants and 52% of non-participants (Table 1)

Table 1. Demographic and socioeconomic characteristics

| | Participants | | Non-participants | | t- statistic |
|----------------------------------|--------------|------|------------------|------|--------------|
| | Mean | SD | Mean | SD | |
| Age of the house hold head (yrs) | 40.4 | 8.1 | 40.3 | 10.0 | NS |
| Formal Education (yrs) | 3.6 | 3.4 | 4.7 | 3.7 | NS |
| Years of training | 2000 | 2.3 | 2007 | 4.3 | NS |
| | 2007 | 0.4 | 2007 | 3.2 | NS |
| | N | % | N | % | (df test) |
| Gender | | | | | NS |
| Male | 48 | 88.9 | 33 | 94.8 | |
| Female | 4 | 11.1 | 2 | 5.2 | |
| Source of income | | | | | NS |
| 1. Agriculture | 54 | 88.2 | 38 | 94.8 | |
| Group member | | | | | NS |
| Yes | 30 | 72.2 | 36 | 83.2 | |
| No | 11 | 27.8 | 7 | 16.8 | |

Note: Source: survey report 2009

These farmers were organized in farmer's group members as of 72% and 67% respectively. The surveyed farmers mainly sold their farm produces (beans) at local market according to 71% and 53% of farmer's participants and non-participants as well as member to cooperatives 21% for participants and 40.2 non-participants. The farmers use improved varieties according to 100% of participants and 91% of non- participants. The type of varieties are Ibado (64%) and OMO -95 (21%) for farmers who were participants and the same varieties were also be used by non- participants 23% and 40% of the farmers as well as Hawassa Dume variety by 17%. and these difference were significant at ($\chi^2 = 23.147, P < 0.01$). Hawassa variety like Nasir, Afar, Awash 1 also used by considerable farmers. These varieties were delivered to farmers through partner organization from Hawassa Agricultural Research Center (HARC) and such type of joint activities with NGOs enhanced the adoption of improved varieties and almost majority of the farmers have been access quality seed of improved bean varieties and complementary crop technologies which improved livelihoods in the region (Table 2). The SARI variety planted according to 100% of farmer's participants and 67% of non - participants. The improved varieties planted by participants, Nasir (48%), Omo -95 (17%) and Ibado (11%) where us for non - participants once Nasir (28%), Omo- 95 (31%), Afar (21%) and Hawassa Dume (13%). The seed sources are predominantly by HARC 62% for participants and 41% for non - participants which is significant ($\chi^2 = 29.734, P < 0.01$).

4.1.1.2 Bean Varieties

Table 2. Bean varieties adopted in the study area

| SARI Varieties | Participants | | Non-participants | | t- test |
|-------------------------|--------------|------|------------------|------|-----------|
| | N | % | N | % | |
| Use of Improved variety | | | | | NS |
| Yes | 54 | 100% | 33 | 91.4 | |
| No | 0 | 0 | 3 | 8.6 | |
| Type of varieties | | | | | 23.147*** |
| Ibado | 34 | 64.2 | 33 | 91.4 | |
| Omo-95 | 11 | 20.8 | 31 | 84.4 | |
| Hawassa Dume | 3 | 5.7 | 6 | 17.0 | |
| Nasir | 3 | 5.7 | 3 | 8.3 | |
| Afar | 1 | 1.9 | 3 | 8.3 | |
| Awash-1 | 1 | 1.9 | — | — | |
| Red Wicket (Local) | 0 | 0 | 1 | 2.8 | |

Source: Survey report, 2009

4.1.1.3 Post Harvest

The post harvest storage involved sun drying according to 28% and 22 % of participants and non- participants. Threshing 47% and 14%, separating (5%) and (6%) and others 21% and 57% accordingly. Post harvest training also involved after threshing 76% for participants and 46% for non- participants, before threshing 19% and 11% as well as at store 5% and 43% and this difference is significant ($\chi^2 = 3.238, P < 0.01$). The reasons using these techniques were to get high yield and quality seed 24% and 76% for participants and 13% and 88% for non- participants accordingly. The different management practices /culture practices were (land preparation 81% and 34% for both participants and non- participants, weeding 12% and 66% and planting 7% for participants and significant ($\chi^2 = 30.948, P < 0.01$). /land preparation timing before planting 29% and 7% as well as after 15 days of planting 71% and 93% if for participants and non- participants respectively (Appendix C)

4.1.1.4 Farmers training

Farmers who were participants in seed production, post harvest management for participants 65% and non - participants 20%. The topics covered were agronomic practices 97 and 100 percent respectively. The training was given by Woreda Office of Agriculture (WOA) according to 83% of participants and 45% non - participants and Agric-service 6% and 55% respectively and significant ($\chi^2 = 14.726 P < 0.01$).

Table 3. Training of farmers in seed quality maintenance

| Trained in seed production (Harvest Mgt) | Participants | | Non-participants | |
|---|--------------|------|------------------|------|
| | N | % | N | % |
| Yes | 33 | 64.8 | 11 | 30.0 |
| No | 19 | 35.2 | 24 | 68.0 |
| Topics covered | | | | |
| Agonomic practice post harvest handling (Storage) | | | | |
| Yes | 34 | 97.1 | 11 | 100 |
| No | 1 | 2.9 | — | — |
| Trained by whom | | | | |
| HARC/ARI/NAI | 4 | 11.1 | — | — |
| Agric- service | 2 | 5.6 | 6 | 54.5 |
| WOA | 30 | 83.3 | 5 | 44.5 |

Source: Survey report, 2009

5. ANALYSIS OF THE IMPACTS OF COMMON BEAN VARIETIES

5.1 Partial Budget Analysis

Improved varieties and fertilizer are able to increase bean production and to improve the farmers' income when farmers adopt them. In assessing the impacts of bean technologies, it is important to estimate the extent to which new bean farmers have adopted technologies and estimate the resulting productivity gains. Farmers are concerned with the benefits and costs of particular technologies. The partial budgeting method is used to assess the impacts of the improved haricot bean technologies adopted by farmers'. Table 3 shows the partial budget analysis for adopters and non-adopters of improved bean varieties. Adopters obtained net benefit of 9375.50 birr/ha and the non-adopters obtained 6591.00 birr/ha. The adopters have gained additional net benefit of 2774.50 birr/ha with the additional variable cost of 1215.50 birr/ ha.

Table 3. Cost-benefit analysis using partial budget

| Technologies | Adopters | Non-adopters |
|----------------------------------|-------------------------------|----------------------------|
| Variable | Improved seed w/fertilizer | Local seed w/fertilizer |
| Yield (kg/ha) | 2000.00 | 1500.00 |
| Grain benefit | 12,400.00 | 8,400.00 |
| Obtained | | |
| Fertilizer and its application | 2,150.00 | 2,200.00 |
| - Seed | 800.00 | 500.00 |
| - Transport | 20.50 | 0.00 |
| Total cost that vary Obtained | 2924.50 | 1899.00 |
| Net benefit (kg/ha) | 9375.50 | 6591.00 |

6. CONCLUSIONS AND RECOMMENDATIONS

This conclusion is based on the descriptive analysis of the assessment on beans. Hence it is evident that haricot bean mainly used as cash income & for consumption. The current seed quality maintenance by farmers should be reviewed and supported by laboratory testing. The impact of improved haricot bean varieties vs. local as depicted in cost-benefit analysis using partial budget is amounted the importance of the crop and the associated benefits could be realized. Therefore, to scale up the use of improved varieties of haricot beans for wider impact is recommendable.

Appendices

Appendix A. The partner Organizations in disseminating improved haricot bean varieties to farmers in their respective Rural Development Area (RDA).

| Partner Organization | Participants | | Non-participants | | N/ total |
|---------------------------------|--------------|------|------------------|------|----------|
| | N | % | N | % | |
| IPMIL (Daba) | 11 | 20.4 | - | - | |
| Imo and France (Dabbat) | - | - | 17 | 46.8 | |
| ERSHA (Gadbi) | 24 | 44.4 | - | - | |
| WONTA (Gadbi) | 13 | 25.6 | 9 | 13.3 | |
| Agri-services: Filogene (Amara) | 4 | 7.6 | 12 | 17.9 | |
| Total | 54 | 48.2 | 38 | 31.9 | |

Source: Survey data, 2009

Appendix B. SARI Varieties Planted

| Have you planted SARI varieties? | Participants | | Non-participants | | N/ total |
|----------------------------------|--------------|------|------------------|------|-----------|
| | N | % | N | % | |
| - Yes | 34 | 100% | 30 | 43.3 | 21,304*** |
| - No | 0 | - | 39 | 53.8 | |
| Type of variety | N | % | N | % | 26,054*** |
| - Nana | 26 | 48.1 | 13 | 18.2 | |
| - Bada | 6 | 11.4 | 2 | 3.1 | |
| - Hawassa Chama | 2 | 3.7 | 3 | 4.3 | |
| - Adha-502 | 1 | 1.9 | 8 | 11.3 | |
| - Amah 1 | 10 | 18.5 | - | - | |
| - Red Watajira (Gadbi) | 9 | 16.7 | 1 | 1.4 | |
| Source of varieties | N | % | N | % | 26,054*** |
| - AAHC | 33 | 62.3 | 19 | 26.7 | |
| - GWS | 4 | 7.3 | 14 | 19.4 | |
| - Erba | 10 | 18.5 | - | - | |
| - IPMIL/ERJ | 4 | 7.3 | - | - | |
| - CBC | 1 | 1.9 | 1 | 1.4 | |
| - Agri-services | 1 | 1.9 | 1 | 1.4 | |

Source: Survey data, 2009

Appendix C. Post Harvest Storage and handling

| Post Activities | Harvest | Participants | | Non-participants | | N/ total |
|---------------------------------------|---------|--------------|------|------------------|------|-----------|
| | | N | % | N | % | |
| Sun drying | | 12 | 27.9 | 11 | 22.8 | |
| Threshing | | 20 | 46.3 | 7 | 14.3 | |
| Separating | | 2 | 4.7 | 3 | 6.1 | |
| Chama | | 9 | 20.9 | 24 | 47.1 | |
| Timing | | 24 | 55.7 | 13 | 26.4 | |
| After threshing | | 3 | 6.9 | 3 | 6.1 | |
| Before threshing | | 2 | 4.4 | 12 | 24.5 | |
| The storage usage of these techniques | | | | | | NS |
| to get high yield | | 9 | 20.9 | 3 | 6.1 | |
| to get quality seed | | 20 | 46.3 | 21 | 43.3 | |
| Management practices (seeds) | | | | | | 30,948*** |
| Seed preparation | | 15 | 31.4 | 19 | 33.9 | |
| planting | | 3 | 6.9 | - | - | |
| weeding | | 3 | 6.9 | 13 | 26.4 | |
| Planting time | | N | % | N | % | 21,304*** |
| Before planting | | 11 | 24.9 | 3 | 6.7 | |

| | | | | | |
|--------------------------------|----|------|----|------|----------|
| After 15 days | 17 | 35.4 | 40 | 81.2 | |
| at harvest | 14 | 29.8 | 21 | 43.3 | |
| at threshing | 24 | 50.8 | 13 | 26.4 | |
| Chama | 1 | 2.1 | - | - | |
| Use of seeds planting material | | | | | NS |
| Yes | 41 | 81.2 | 41 | 81.2 | |
| No | 9 | 18.7 | 11 | 22.8 | |
| if yes | | | | | 22,827** |
| Clean with water | 26 | 54.4 | 13 | 26.7 | |
| to compare with their seeds | 14 | 29.8 | 4 | 8.1 | |
| Take care before | 6 | 12.5 | 9 | 18.1 | |
| Chama | 3 | 6.2 | 21 | 43.3 | |
| if No why | | | | | NS |
| do not want to sell | 3 | 6.9 | 6 | 12.5 | |
| Chama | - | - | 1 | 2.1 | |
| Not used | 3 | 6.9 | 6 | 12.5 | |
| Chama | - | - | 2 | 4.1 | |
| if stored use seed | | | | | 26,185** |
| Clean away | 17 | 35.4 | 6 | 12.5 | |
| No | 11 | 22.9 | 10 | 20.4 | |
| Chama | 3 | 6.2 | 9 | 18.1 | |
| don't put others | | | | | 6,680** |
| Stored by each | 44 | 90.9 | 40 | 81.2 | |
| Chama | 9 | 18.7 | 10 | 20.4 | |

Source: Survey data, 2009

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